

2019 Conference Program

Big Sky Resort





Kevin Harvey Dr. Gwendelyn Geidel Dr. Robert Darmody Amy Blyth Rachel Schmidt Kennet Bertelsen Mehgan Blair Julie LaBar Dr. Pete Stahl Dustin Wasley

A Special Thanks to Our Conference

Planning Committee

ASMR President-Elect/KC Harvey/Conference Chair ASMR President/University of South Carolina ASMR Executive Secretary Trihydro Corporation KC Harvey/Conference Co-Chair Morrison-Maierle 2020 Conference Chair/Barr Engineering Centenary University University of Wyoming GeoEngineers



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High Altitude Revegetation Committee

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Exhibitors (in alphabetical order)

ACF West ACZ Labs Arkansas Valley Seed Bio Lynceus Brierly Associates Energy Laboratories, Inc. ERTEC Environmental Systems Fiber Marketing International, Inc. Foam Concepts, LLC GeoEngineers Granite Seed & Erosion Control Herrera Environmental Consultants KC Harvey Midas Gold OSMRE Pace Analytical Labs Pacific Inter-Mountain Distribution Pioneer Technical RESPEC Rocky Mountain Bio Products Rocky Mountain Reclamation Sitesee-Ramboll Stevenson Intermountain Seed, Inc. Trihydro Corporation Truax Co. Voss Signs, LLC Water & Environmental Technologies



See you in beautiful Duluth, MN, June 7-11, 2020! Thank you for your support and attendance this year. Check our conference app at <u>https://yapp.us/JFFTRM</u>

Sunday, June 2, 2019

8:00 a.m. - 5:00 p.m. Professional Field Tour #1: McLaren Tailings Reclamation Project. Join us for a tour of the McLaren Tailings site, located near Cooke City, Montana, in a valley drained by Soda Butte Creek, which runs through the site and Yellowstone National Park. We will explore the reclamation work the Montana Department of Environmental Quality began in June 2010. Excavation of the tailings required extensive construction dewatering and water treatment to excavate the tailings safely. This event includes transportation to and from Bozeman and lunch. For more info, see https://www.asmr.us/Meetings/2019-Annual-Meeting/Special-Events

Monday, June 3, 2019

8:00 a.m. - 5:00 p.m. 10:00 a.m. - 5:00 p.m. 10:00 a.m. - 4:00 p.m. 6:30 p.m. - 9:00 p.m. All day

Tuesday, June 4, 2019

6:30 a.m. - 7:30 a.m.

Registration - Firestone Lounge Exhibitor Setup - Gallatin NEC Meeting - Shoshone Room Welcome Reception - Jefferson/Madison ASMR Office - Lake

Haulin' ASMR - Meet in lobby of Huntley Lodge

Don't miss the chance to run at an elevation of 7,000 feet with beautiful views of Big Sky Resort and the Gallatin National Forest as Haulin' ASMR kicks off every morning of the annual meeting. Big Sky is known for its vast abundance of native wildflowers that usually hit full bloom in late spring! All runners and walkers are welcome and encouraged to join the group as they get ready for the day. This is a great opportunity to network with other conference attendees while enjoying the fresh mountain air and beautiful scenery Big Sky has to offer. Don't forget to bring your running or walking shoes, pack a few extra layers, and check the weather!

6:30 a.m 8:30 a.m.	Breakfast - Huntley Dining Room
7:00 a.m 8:30 a.m.	Wild Women of Reclamation - Cheyenne
Participants meet before the morning talks at a kickoff break dealt with choosing your own path, mentoring, starting your	cfast early in the conference. Every woman is welcome. Presentations in the past have own business, and juggling a research career with family and community obligations.
7:30 a.m 5:00 p.m.	Registration - Firestone Lounge
9:00 a.m 5:00 p.m.	Exhibitors - Gallatin
9:00 a.m 6:00 p.m.	Silent Auction - Cheyenne
8:45 a.m 9:30 a.m.	Plenary Session - Jefferson/Madison
Mr. Kevin Harvey - ASMR President-Ele Dr. Gwendelyn Geidel - ASMR Presiden Dr. Robert Darmody - ASMR Executive	ect and Conference Chair - Welcome to Big Sky t - President's Welcome and Keynote Address Secretary - Welcome & Announcements
9:30 a.m 10:00 a.m. Daniel Powell, Chief, Technology Integration, ar Innovation, U.S. E.P.A.: US EPA Perspe	Keynote Speaker – Jefferson/Madison nd Information Branch, Office of Superfund Remediation and Technology actives on Abandoned Mine Cleanup: Challenges and Technology Opportunities
10:00 a.m 10:30 a.m.	Break - Lower Atrium
10:30 a.m. – 12:00 noon Dr. William Inskeep, Thermal Biology Institute, Earth's Natural Laboratories: What Car	Keynote Speakers – Jefferson/Madison Montana State University: n Reclamation Science Learn from Geothermal Systems in Yellowstone?
Autumn Coleman, Abandoned Mine Land Progr Ray, Ecologist, U.S. N.P.S., Greater Yell	ram Manager, Montana Department of Environmental Quality and Dr. Andrew lowstone Network: Ecological Recovery of Yellowstone's Soda Butte Creek.

12:00 noon - 2:15 p.m. AWARDS LUNCHEON / ASMR BUISNESS MEETING - Huntley Dining Room

	TUESDAY, JUNE 4, TECHNICAL SESSIONS					
	WATER QUALITY CHALLENGES SESSION 1A ROOM: AMPHITHEATER Moderator - Dan Guy	STREAM RESTORATION SESSION 1B ROOM: JEFFERSON Moderator - Sara Klopf	ALTERNATIVE APPROACHES FOR REMEDIATING LEGACY MINE SITES SESSION 1C ROOM: LAMAR/GIBBON Moderator - Amy Blyth			
2:30 p.m 3:00 p.m.	Streamflow Variability and Treatment System Effectiveness in a Changing Climate by N.A. Kruse Daniels, Z. Matthews	Stream Restoration Techniques to Mitigate the Yellowstone Hydroelectric Decommissioning Project in Duchesne County, Utah by Crystal Young, L. Forbes	Trout Unlimited - A Non Profit Approach to Mine Reclamation by Rob Roberts			
3:00 p.m 3:30 p.m.	An Evaluation of Biological and Chemical Improvements at Various Spatial Scales in the West Branch Susquehanna River Watershed, Pennsylvania by S. Rummel, A. Wolfe, R. Kester, K. Lavelle, A. Lutz	Reclamation of the McLaren Tailings: The Rest of the Story by M. Bennett, T. Henderson, A. Coleman	Golden Sunlight's Outside Ore Program by Steve Lloyd			
	3:30 P.M 4:00 P.M.	- BREAK - LOWER ATRIUM				
	UAV MONITORING AND MODELING TECHNOLOGIES SESSION 2A ROOM: AMPHITHEATER Moderator - Natalie Kruse Daniels	MINE WASTE COVERS AND SOURCE CONTROL TECHNIQUES SESSION 2B ROOM: JEFFERSON Moderator – Nicholas Shepherd	INTERNATIONAL RECLAMATION CASE STUDIES SESSION 2C ROOM: LAMAR/GIBBON Moderator - Zepei Tang			
4:00 p.m 4:30 p.m.	Prediction of Optical and Non- Optical Water Quality Parameters in Oligotrophic and Eutrophic Systems Using a Small Unmanned Aerial System and Handheld Hyperspectral Radiometers with Relation to Development of Water Quality Models in Mine Drainage Systems by Juan Arango [*] , R. Nairn	Application of Coupled Surface and Subsurface Hydrological Modeling in Hydrology-Based Reclamation Technique of Mine Lands by Z. Fred Zhang, T. Tesfa, C. Liao	Reclamation of Sulfur Borehole Mine Sites and Environment Consequences of S Extraction (Poland) by M. Pietrzykowski, J. Likus-Cieslik ,			

	TUESDAY, JUNE 4, TECHNICAL SESSIONS				
4:30 p.m 5:00 p.m.	Evaluating the Role of Optical Depth on Spectral Reflectance Data from sUAS-Mounted Multispectral Sensors and Handheld Hyperspectral Radiometers with Relation to Development of Water Quality Models in Mine Drainage Systems by B. Holzbauer-Schweitzer*, R. Nairn	French Gulch Restoration Case Study (MT) by Matt Barnes	Spatial Distribution of Reconstructed Soil Volume Density in Loess Open-pit Mining Area Based on IDW Interpolation (China) by Shu-fei Wang, Y. Cao, Z. Bai		
5:00 p.m 5:30 p.m.	Applying UAV Imagery to Minimize Impacts to Surface Water from Oil and Gas Development by M. Strager, P. Kinder, S. Grushecky, J. Strager	Geotechnical and Soils TD Business Meeting	Evaluation of Restoration Achievement for the Release of Upland Grasslands from Statutory Aftercare Provisions at a Surface Mine in South Wales, UK. by Neil Humphries, R. Thompson		
5:30 p.m 6:00 p.m.	Coal Mining Subsidence and Its Effects on Agricultural Land - A UAV Based Investigation in Eastern China by W. Xiao, Z. Hu, J. Chen	Open	International Tailings TD Business Meeting		

6:30 - 8:30 P.M. SOCIAL EVENT: LONE PEAK PAVILION or HUNTLEY DINING ROOM (weather dependent) Join us for food, beverages, and music by the Dodgy Mountain Men. They sling a home-brewed Montana stompgrass that goes down smooth but packs a bite, mixing the rhythms of bluegrass, the soul of blues, and energy of rock 'n' roll, with a plethora of other musical traditions to create a unique electro-acoustic experience. Their genre-bending experimentation and passion for American roots traditions weave together to emphasize their lyrical storytelling, creating a musical frontier rife with empty mason jars, outlaws, gypsy women, and cold Montana storms."

McLaren Tailings Site - Pro Tour 1 Destination



Wednesday, June 5, 2019

6:30 a.m 7:30 a.m.	. Haulin' ASMR - meet in the Huntley Lobby
7:00 a.m 8:00 a.m.	. Breakfast - Huntley Dining Room
7:45 a.m 8:30 a.m.	. JASMR Editorial Meeting, TD Chair Meetings (TBA)
8:00 a.m 5:00 p.m	. Exhibitors - Gallatin
8:00 a.m 6:00 p.m.	. Silent Auction - Cheyenne Room
7:30 a.m 5:00 p.m	Registration - Firestone Lounge
11:00 a.m 4:00 p.m	. Cultural Event #1

Cultural Event #1: Shopping and Lunch in Historic Downtown Bozeman – This event, aimed at spouses/guests, will include chartered transportation from Big Sky Resort to historic downtown Bozeman. Explore the charming Western mountain town full of shops, cafes, restaurants, art, and music. Lunch is on your own.

	WEDNESDAY, JUNE 5, TECHNICAL SESSIONS				
	ECOLOGICAL ENGINEERING APPROACHES TO TREATING WATER SESSION 3A ROOM: AMPHITHEATER Moderator - Travis Tasker	RECLAMATION OF OIL AND GAS RELATED DISTURBANCES SESSION 3B ROOM: JEFFERSON Moderator - Michael Curran	INTERNATIONAL RECLAMATION CASE STUDIES SESSION 3C ROOM: LAMAR/GIBBON Moderator – Jennifer Franklin	GIS TECHNOLOGIES APPLIED TO RECLAMATION SESSION 3D ROOM: DUNRAVEN/ OBSIDIAN Moderator - Kari Lagan	
8:30 a.m 9:00 a.m.	Removal of Gaseous and Aqueous Biogenic Sulfide from Vertical Flow Bioreactor Effluent via Solar-Powered Blowers by R. Nairn, T. Wall	Restoration of Native Grasslands to Provide Monarch Habitat on the Enbridge Valley Crossing Pipeline in the South Texas Sand Sheet by T. Falk, K. Pawelek, F. Smith, D. Hoetzel	Land Reclamation Planning for Underground Coal Mining Areas and Case Studies in China by Zhenqi Hu	Geocoding ASMR Proceedings to Preserve and Easily Access Reclamation Research by A. Rovder*, S. Wolfe, K. Lagan, L. Currie, W. Strosnider, P. Smyntek	
9:00 a.m 9:30 a.m.	A Permeable Reactive Barrier (PRB) for the Immobilization of Se in Seep Water and Shallow GW at a Phosphate Mine in Southern ID: Results of Bench Scale Testing by William J. Walker, et al.	Soil Reclamation after a Bakken Crude Pipeline Release: A Summary of Research Results by T. DeSutter, P. O'Brien, S. Croat, C. Gasch, F. Casey, A. Wick	Biodiversity Development and Soil C Sequestration Efficiency of Certain Woody Species Planted on Coal Mine Habitats, India: A Case Study by A. Singh, R. Kaur	Development of a GIS Tool for Estimating Post-Mining Water Levels in Underground Coal Mines of Ohio by R. Steinberg*, et al.	

	WEDNESDAY, JUNE 5, TECHNICAL SESSIONS					
9:30 a.m 10:00 a.m.	The Influence of Bacteria on Passive Remediation Systems by Michelle Valkanas*, N. Trun	Subsurface Mine Void and Karst Imaging Using 3D Seismic Methods; Adapting Oil and Gas Seismic Advancements to Develop 3D Integrated Site Characterization Models	Open	Evaluating Herbicide Treatment Effectiveness Using GPS Treatment Data & ArcGIS tools: 2016-2018 by W. Erickson, A. Matthews		
	10:00 A	.M 10:30 A.M. BREAK - LC	JUNER ATRIUM			
	ECOLOGICAL ENGINEERING APPROACHES TO TREATING WATERRESTORATION OF NATIVE GRASS COMMUNITIESTHE FUTURE OF COAL SESSION 4CLOOKING AT RECLAMATION OVER THE LONG TERMSESSION 4A ROOM: AMPHITHEATERRESTORATION OF NATIVE GRASS COMMUNITIESTHE FUTURE OF COAL SESSION 4CLOOKING AT RECLAMATION OVER THE LONG TERMROOM: AMPHITHEATERRESTORATION OF NATIVE GRASS COMMUNITIESTHE FUTURE OF COAL SESSION 4CLOOKING AT RECLAMATION OVER THE LONG TERMModerator - Gwendelyn GeidelROOM: Moderator - Louis McDonaldSESSION 4D Noderator - Noderator - Robert Hedin					
10:30 a.m 11:00 a.m.	Temperature Effects on Selenium (Se) Cycling in Simulated Constructed Wetland Microcosms by Michael P. Nattrass *, J. I. Morrison, B. Baldwin	Native Warm-Season Grasses That Germinate on Command by Brian Baldwin, J. Morrison, J. B. Rushing	New Generation Coal Fired Power Plants: Innovation at the Dry Fork Station, Gillette Wyoming by B. Schladweiler, D. Hugo	Acid Mine Drainage Takes Its Time to Burn Out - a case for Interceding with Spot Treatments? by Michele Coleman, K. Butler, D. Loomer		
11:00 a.m 11:30 a.m.	Modeling the Effects of Mass Transfer Limitations in Limestone-Based Passive Treatment Systems by Joel Bandstra, W. Strosnider	Establishing Native Grassland Plants on Mineral Sands Mines by Sara Klopf, L. Daniels, Z. Orndorff	Analysis of Coal Production, Severance Tax Revenues, and Water Infrastructure Relationships in West Virginia by Hannah Patton [*] , E. Sarver, L-A. Krometis	Financial Assurance for Long- Term Reclamation by D. Sutton, D. Herrera		
11:30 a.m 12:00 p.m.	Spaghetti Hole: Retrofit Options for an Aging Passive Treatment System by J. Gaughan*, et al. 12:00 P.M 1:30 P.M.	Assessment of Native Warm Season Grasses for Post- Mining Reclamation by Jesse Morrison, M. Parker, N.R. McGrew, B. Baldwin	SMCRA Fee Collection Reauthorization: Ensuring the Future of Abandoned Coal Mine Reclamation by A. Wolfe, A. McAllister m - Speaker: Dr. Timothy M	Effects of Grazing Management and Climate Change on Extent of Semiarid Riparian Meadows by B. Fulcher*, J.B. Norton, M. Kasten		
12:00 P.M 1:50 P.M. Lunch - Hundley Dining Room - Speaker: Dr. Timothy McDermott -						

Re-Examining Microbial Methane Synthesis: Methanogenesis Isn't Just For Methanogens Anymore!

	WEDNESDAY, JUNE 5, TECHNICAL SESSIONS				
	ACID MINE DRAINAGE, HYDROLOGY AND TREATMENT SESSION 5A ROOM: AMPHITHEATER Moderator - Gwendelyn Geidel	RECLAMATION: SOIL SCIENCE SESSION 5B ROOM: JEFFERSON Moderator – Brad Pinno	ALTERNATIVE APPROACHES FOR REMEDIATING LEGACY MINE SITES SESSION 5C ROOM: LAMAR/GIBBON Moderator - John Stefanko	MINE FIRES AND EMERGENCY RESPONSES SESSION 5D ROOM: DUNRAVEN/ OBSIDIAN Moderator – Ryan Mahony	
1:30 p.m 2:00 p.m.	Developing a Long-Term Hydrologic Monitoring Plan for Surface Coal Mines by K.D. Krogstad	Impacts of Soil Stockpiling on Seed Viability and Vegetation Communities by Jennifer Buss*, B. Pinno	Reclamation of Abandoned Mine Lands in Conjunction with Economic and Community Development and Reuse Goals - Implementation of the 2016 AML Pilot Program in PA by Dean Baker	Phillips Mine Fire - A Containment & Extinguishment Design Plan by C.A. Neely, T. Danehy, R. Mahony, B. Page, M. Dunn, D. Guy, D. Baker, R. Rummel	
2:00 p.m 2:30 p.m.	50 Years of AMD Pollution and Remediation at the Anna S Mine, Tioga County, PA by Robert Hedin	Effect of Topsoil Stockpiling and Organic Amendments on Soil Properties and Tree Growth During Gold Mine Reclamation in Ghana by Paul K. Nsiah*, W. Schaaf	Non-Traditional Reclamation of Abandoned Mine Lands to Support Economic Revitalization and Community Development - Implementation of the 2017 AML Pilot Program in PA by Eric Cavazza	Unconventional Seismic Studies at a Coal Mine Fire Before and After Reclamation Efforts by L. Steele, D. O'Connell, J. Nuttall, T. Tafi, J. Turner	
2:30 p.m 3:00 p.m.	Effects of Precipitation Patterns on Sediment, Nutrient, and Biofilm Dynamics in an Acid Mine Drainage Stream by J. Brancho*, N. Kruse Daniels, M.L. Vis	Soil Water Chemistry of Reforested Mine Site in West Virginia by A. Hass, J. Skousen, R. Cantrell	Implementation of the 2018 AML Pilot Program in Pennsylvania - AML Reclamation as an Economic Catalyst by Patrick Webb	Emergency Response to Historic Pit Mine Washout Leads to Improved Resiliency, Functionality, and Aesthetics by P. Kero, J. Olson, L. Johnson	
	3:00 p	.m 3:30 p.m. BREAK - L	OWER ATRIUM		
	ACID MINE DRAINAGE, HYDROLOGY, AND TREATMENT SESSION 6A ROOM: AMPHITHEATER Moderator – Kennet Bertelsen	RECLAMATION OF FOREST COMMUNITIES SESSION 6B ROOM: JEFFERSON Moderator - Amir Hass	RECLAMATION CASE STUDIES SESSION 6C ROOM: LAMAR/GIBBON Moderator - Mehgan Blair	SKILL SET NEEDS FOR NATURAL RESOURCE MANAGERS SESSION 6D ROOM: DUNRAVEN/ OBSIDIAN Moderator - Abbey Wick	
3:30 p.m 4:00 p.m.	Preliminarily Assessing Ferrate (Fe(VI)) as an Acid Mine Drainage Treatment Option by J.E. Goodwill, J. LaBar, D. Slovikosky, W. Strosnider	Early Tree Growth in Brown and Gray Mine Soils Compared to Growth in Native Forest Soils by J. Skousen, K. Dallair	Life Cycle of a Successful Reclamation Program by R. Spang	Helping Students of Natural Resource Management Develop a Land Ethic by Pete Stahl	

	W	EDNESDAY, JUNE 5, TECHN	WEDNESDAY, JUNE 5, TECHNICAL SESSIONS				
4:00 p.m 4:30 p.m.	The Use of Advanced Membrane Filtration as an AMD Remediation Method by M.J. McCluskey	Tree Growth and Regeneration on Reclaimed Oil Sands Mine Sites in Northern Alberta by Brad Pinno	Atlantic City Iron Mine, Wyoming Case Study Post-Reclamation 17-Year Status by Brenda Schladweiler, James Gusek	University of Wyoming Extension Reclamation Workshops by Jay Norton			
4:30 p.m 5:00 p.m.	Abatement of AMD at Abandoned Coal Mines in North Central Missouri: An Overview by Paul Behum, D. Wedemeyer, M. Meuller	A Recently Translocated Woodland Plant-Soil Ecosystem: Some Early Outcomes and Lessons Learnt (UK) by Neil Humphries	Reclamation Case Study: Road Decommissioning in Indiana and Pennsylvania Gulches, White River National Forest by Tony Matthews, J. Feeback	Succession Planning for 2025 - Do You Really Know the Next Generation of Reclamation Researchers? by S. Bellgard, S. Williams			
5:00 p.m 5:30 p.m.	Source Control or How to Eliminate Acidophiles and Influence Water Quality by Paul Eger, J. Gusek, L. Josselyn, T. Clark	Using the Forestry Reclamation Approach in the Western Gulf Region: Impacts on <i>Pinus taeda</i> Seedling Growth and Survival by Cassie Phillips*, J. Stovall. H. Williams, K. Farrish	Development of Mine Soils in a Chronosequence of FRA- Reclaimed Sites in Eastern Kentucky by K. Sena, K. Yeager, J. Lhotka, C. Barton	Proposed Skill Set for Effective Natural Resource Managers of the Future by Steve Wiliams, S. Bellgard			
5:30 p.m 6:00 p.m.	Water Management TD Business Meeting	Open	Open	Land Use TD Business Meeting			

6:00 P.M. - 7:00 P.M. POSTER SESSION AND NETWORKING EVENT - Jefferson/Madison

Poster presentations will be on display, with authors present after the technical sessions finish.

7:00 P.M. - 8:30 P.M. Film Festival - Jefferson/Madison

Join us for the First Annual ASMR Film Festival. We will bring reclamation related topics to you in a whole new way with short (~5-15 minute) films highlighting exciting and intriguing reclamation projects. Awards will be presented to the best in show, and libations and classic movie theater snacks will be provided.

P	OSTER SESSION - Jefferson/Madison - WEDNESDAY, JUNE 5 6:00 PM - 7:00 PM				
1	Abatement of AMD at the Germantown AML site in West Central Missouri by Paul Behum, D. Wedemeyer				
2	Prediction of Sludge Generation in Mine Drainage Treatment Plan with Lime Dosing by Young-Wook Cheong				
3	Scale Composition and an Automatic Cleaning Device for pH Electrodes Used in Mine Drainage Treatment by Gil-Jae Yim, et. al				
4	The Role of Solar-Powered Float-Mix Aerators on Iron Oxidation Rates in Passive Treatment Oxidation Ponds by Dayton Dorman*				
5	One Steppe: Efforts from Multiple Stakeholders in Wyoming to Streamline Disturbance, Reclamation, and Conservation Efforts by M. Curran*, N. Graf, T. Wychoff, P. Stahl				
6	Flow Visualization Utilizing Airborne Thermography by John Gaughan*				
7	Sulfate Removal by Selected Organic Substrates in Continuous Flow-Through Columns by J.D. Ingendorf st				
8	Post-Reclamation Long-Term Monitoring and Care at the Shullsburg Mine in the Upper Mississippi Valley Lead-Zinc District by Sage Tanck*, John Zurawski*, Yari Johnson*				
9	Optimization of Drainable Limestone Beds for Treatment of Acid Mine Drainage by Kari Lagan*				
10	Super Absorbent Polymer effects on Soil Physical Properties as Functions of Application Rate and Soil Texture by Megan Ostrand*				
11	Geocoding American Society of Mining and Reclamation Proceedings to Preserve and Easily Access Reclamation Research by Ashley Rovder*				
12	Locating and Characterizing Mine Drainage Sources in a Topographically Challenging Location at the Tar Creek Superfund Site, Oklahoma by Nick Shepherd*				
13	Modeling the Effects of Improved Stormwater Management at a Large Open-Pit Mine by Staci Shoemaker*				
14	Treating Acid Mine Drainage with Ferrate (Fe VI): A Preliminary Assessment by Debbie Slovikosky*				
15	Bench Scale Assessment of Acid Mine Drainage Addition to Secondary Municipal Wastewater Treatment Processes for Co- Treatment by Charles Spellman*				
16	The Role of Mixing on Nutrient and Metal Interactions at the Sediment-Water Interface by Zepei Tang st				
17	Reclamation Planning in the Intermountain West by Brad Teson				
18	Vegetation Community Dynamics on Soil Islands in Oil Sands Reclamation by Kaitlyn Trepanier*				
19	Succession After Reclamation: Identifying and Assessing Ecological Indicators of Forest Recovery on Reclaimed Oil and Natural Gas Well Pads by Randi Lupardus, A. McIntosh, A. Janz, D. Farr				
20	The Ecological and Economic Efficacy of Hillslope Erosion Control Features in Forest Lands After Severe Wildfire by Patrick McGunagle*				
21	Interlayered Soil Profile Reconstruction in Reclaiming Subsided Land with Coal Gangue by Yuling Gong st				
22	Improving Pedotransfer (PTFs) Functions Using Recursive Feature Elimination and Random Forest for Predicting Soil Saturated Hydraulic Conductivity by Xin Wang*				
23	Wool Erosion Control Blankets: an New Roadside Reclamation Tool by Kristen O'Neill*				
24	Do Weeds Hinder the Development of Native Plants on a Reclaimed Boreal Mine Site? by Brea Burton*				
25	Microbial Community Structure and Diversity in Co-Treatment of Acid Mine Drainage with Municipal Wastewater by Rachel C. Wagner et al.				
	* denotes Student				

FILM FESTIVAL - Jefferson/Madison - WEDNESDAY, JUNE 5 - 7:00 - 8:30 PM

Join us for the First Annual ASMR Film Festival. We will bring reclamation related topics to you in a whole new way with short (~5-15 minute) films highlighting exciting and intriguing reclamation projects. Awards will be presented to the best in show, and libations and classic movie theater snacks will be provided.

1	Superfund Remediation at Tar Creek by Summer King			
2	Rewinding A River by Paul Parson			
3	Industrial and Metallic Minerals Mine Reclamation in Missouri by Mariah Morrison			
4	Reclamation in the Heartland: Cleaning up the Tar Creek Superfund Site by Brandon Holzbauer-Schweitzer*			
5	Salinity Management Strategies by Abbey Wick			
6	High Desert Reclamation in Wyoming by Brad Teson			
7	Our Work's Not Done by Eric Cavazza			
8	Hollywood Treatment Plant by Eric Cavazza			
9	Coal Mine Reclamation in Montana by Julian Calabrese			
10	French Gulch Restoration Project by Pedro Marques			
11	Repairing the Damage - Peat Bog Reclamation by Neil Humphries			



For the most up-to-date conference information, please log on to our app <u>https://yapp.us/JFFTRM</u> or ASMR's website, https://www.asmr.us/Meetings/2019-Annual-Meeting.

Thursday, June 6, 2019

6:30 a.m 7:30 a.m.	. Haulin' ASMR - Meet in lobby
7:00 a.m 8:00 a.m.	. Breakfast - Huntley Dining Room
7:30 a.m 5:00 p.m	Registration - Firestone Lounge
8:00 a.m 4:00 p.m	. Exhibitors - Gallatin
8:00 a.m 11:00 a.m.	Silent Auction - Cheyenne (winners announced at lunch)
11:00 a.m 4:00 p.m	. Cultural Event #2

Cultural Event #2. Grizzly and Wolf Discovery Center – While you are visiting us here in the Rocky Mountains come meet some of our fiercest wildlife up close and personal! The Grizzly and Wolf Discovery Center in West Yellowstone is a wildlife park and educational facility that houses 7 grizzly bears, 5 wolves, and several birds of prey. This event includes chartered transportation from Big Sky Resort to the Discovery Center and admission.

	THURSDAY, JUNE 6, TECHNICAL SESSIONS				
	MINE WASTE CHARACTERIZATION	RECLAMATION OF FOREST	WILDLIFE HABITAT RESTORATION	GEOMORPHIC RECLAMATION STRATEGIES	
	AND REMEDIATION SESSION 7A	SESSION 7B	SESSION 7C	SESSION 7D	
	ROOM:	JEFFERSON	ROOM: LAMAR/ GIBBON	ROOM: DUNRAVEN/ OBSIDIAN	
	Moderator - Craig Kreman	Moderator - Hannah Angel	Moderator - Summer King	Moderator - Mark Donner	
8:30 a.m 9:00 a.m.	Fred Burr Creek Historic Tailings Characterization by Ed Spotts, C. Lucy	Field-testing Transgenic American Chestnuts on Basiaimed Coal Minos	Insect Response to Reclaimed Natural Gas Well Pads in Semi-Arid Wyoming	Modeling Water Balance of Geomorphic Evapotranspiration Covers for Reclamation of Mine	
		by Sara Klopf, J. Holiday	by Michael Curran*	by Z. Fred Zhang, Y. Fang, N. Bugosh, T. Tesfa	
9:00 a.m 9:30 a.m.	Development of a Reliable Field Testing Protocol for Acid-Forming Materials	Tree Response to Soil Treatments on Quarry Overburden	Remediation of Tar Creek: Shifts in Bird Community Composition Over Time	Lessons About Geomorphic Reclamation From Sediment Yield Quantification and Erosion	
	by Lee Daniels, B.T Thomas, E. Shatnawi, E. Farouz	by Jennifer Franklin, D. Buckley	by Christine Rega-Brodsky, S. King, K. Mallatt	by Nicholas Bugosh	
9:30 a.m 10:00 a.m.	Techniques to Refine Initial Amendment Selection for Dispersed Mine Tailings Reclamation	Soil Characterization and Identification of Native Hyper- Accumulating Plant Species for Phytoremediation	Bird Use in a Restored Riparian Corridor, Southwest Montana	Restoring the Hydrology - Key to Successful Reclamation at the Riley Pass Uranium Mine	
	by A. Harley, J. Willis	(Nigeria) by A.A. Adesipo*, O.O. Awotoye, A.T. Salami, D.J. Oyedele	by R. Prodgers, N. Kohler	by Mary Beth Marks, M. Hatten, M. Donner	
	10:00 a	m 10:30 a.m. BREAK - L	OWER ATRIUM		

THURSDAY, JUNE 6, TECHNICAL SESSIONS						
	PASSIVE TREATMENT OF MINE WATER SESSION 8A ROOM: AMPHITHEATER Moderator - Cliff Denholm	RECLAMATION STRATEGIES AND TECHNIQUES SESSION 8B ROOM: JEFFERSON Moderator - Jennifer Franklin	DEEP MINE CLOSURE AND RECLAMATION SESSION 8C ROOM: LAMAR/ GIBBON Moderator - Seth Cude	GEOMORPHIC RECLAMATION STRATEGIES SESSION 8D ROOM: DUNRAVEN/ OBSIDIAN Moderator - Mark Donner		
10:30 a.m 11:00 a.m.	Case Study: Baird Wetland Mitigation 3rd Year Update by S.L Busler, et al.	Cost-effective Strategies for the Restoration of Drastically Disturbed Sites by D.F. Polster	Abatement of Abandoned Coal Mine Hazards Beneath a Rural Road by C. Stock, J. Nuttall, M. Bautz	An Analysis of Cost Factors in Geomorphic Mine Reclamation by Harold Hutson		
11:00 a.m 11:30 a.m.	Performance Evaluation of the North Fork Montour Run Passive Treatment System by T. Danehy, R. Beam, R. Mahony, C. Neely, C. Denholm, D. Guy	Successful Revegetation Techniques for Legacy and Active Mine Sites by Brent Hardy	Challenges to Mine Backfilling in Poor Rock Formation with High Artesian Mine Water Pressure by M. Gamal, D. Hibbard, M. Bautz	A Cost Effectiveness Analysis of Geomorphic Reclamation by Roger Coupal, K. Hufford, K. Fleisher		
11:30 a.m 12:00 p.m.	Land Application Disposal System Design for Biochemical Reactor Treated Effluent by N.R. Anton, D. Shanight, C.S. Storrar, M.J. Fischer, E.M. Janoviak, B. Lala	Industrial Hemp as a Potential Crop for Reclaiming Disturbed and Contaminated Soils by Louis McDonald	Geochemistry of Improved Groundwater Quality Resulting from Adit Plugging, Glengarry Mine, New World District, Cooke City MT USA by Lisa Kirk, L. Bozeman, A. Kirk, M. Marks	Assessing Physiographic Controls on Snow Accumulation and Vegetation Cover in Traditional and Geomorphic Mineland Reclamation Using Airborne Lidar and High- Resolution Satellite Data by E.A. Gage, K. Fleisher, K. Hufford		
12:00 P.M 1:30 P.M LUNCH AND STUDENT PRESENTATION AWARDS - HUNTLEY DINING ROOM						
	REGULATORY ISSUES RELATED TO RECLAMATION SESSION 9A ROOM: AMPHITHEATER Moderator - Neil Humphries	SAGE GROUSE HABITAT RESTORATION SESSION 9B ROOM: JEFFERSON Moderator - Pete Stahl	NOVEL RECLAMATION STRATEGIES AND TECHNIQUES SESSION 9C ROOM: LAMAR/ GIBBON Moderator – Michele Coleman	MINE RECLAMATION HYDROLOGY SESSION 9D ROOM: DUNRAVEN/ OBSIDIAN Moderator - Dustin Wasley		
1:30 p.m 2:00 p.m.	Integration Reclamation Oriented Water Management Within Regulation by J. Staldine, C. Yde	Restoration of Wyoming Big Sagebrush to Intact Rangelands within a Greater Sage-Grouse Core Population Area, Converse County, Wyoming by Jana White	Innovative Methods for Cost Effective Rehabilitation of Challenging Mining and Energy Sites by M. Theisen, A. Jung	Finite Element Water Balance Modeling in a Coal Refuse Pile Cap and Cover Reclamation by I.L. Santos*, L. Cyphers, J. Quaranta, L. Hopkinson		

THURSDAY, JUNE 6, TECHNICAL SESSIONS					
2:00 p.m 2:30 p.m.	A River Runs Through It: Designing and Permitting the Stibnite Gold Project by Dale Kerner	Seeding the Future: Wyoming AML Native Plants Project by Gina Clingerman, D. Newton	Usibelli Coal Mine (AK): Concurrent Reclamation is Yielding Success! by R.C. Sivils	Mine Water Reclamation in Appalachia Facilitated by Student Support and Technical Assistance from Academia by Travis Tasker, J. Eckenrode, W. Strosnider	
2:30 p.m 3:00 p.m.	Potential Effects of the Proposed New Definition of <i>Waters of the U.S.</i> in Relation to Mining by R.T. Franzman, C.R. Terrell	Reestablishment of Wyoming Big Sagebrush in Eastern Wyoming for Sage Grouse Habitat Restoration by Pete Stahl	Cast Blasting as a Cost Saving Reclamation Tool: A Case Study by S. M. Cude	Day Loma Pit - Water Filled Pit Backfill Method by Harold Hutson	
3:00 p.m 3:30 p.m.	How Do We Know That the Land Has Been Reclaimed - Regulatory Approach for a Surface Coal Mine (WY, USA) by A.K. Waitkus	Seed Enhancement Technologies for Native Plant Restoration on Reclaimed Mine Land by M. Eshleman, C. Riginos	Monitoring and Assessment: Evaluating Reclamation Success of Surface Coal Mine Reconstructed Rangelands by E.A. Vasquez	Laboratory Testing to Optimize Retention Time in Auto-Flushing Limestone Beds by J.A. LaBar, C.A. Neely, C.F. Denholm, T.P. Danehy, W.H.J Strosnider	
3:30 p.m 4:00 p.m.	Ecology TD Business Meeting	Forestry and Wildlife TD Business Meeting	Open	30 Years of Reclamation and Remediation in the Silverton Caldera of Colorado by Steven Lange	
* indicates Student presentation					
NEC WRAP UP MEETING 4:00 P.M 5:00 P.M Canyon Room					

5:30 P.M. - 9:00 P.M. EARLY CAREER PROFESSIONAL EVENT: Andiamo Italian Grill

This event will bring together early career professionals and experienced professionals who will provide valuable mentorship. The event will include food, beverages, and fun ways for early career professionals and mentors to interact.



Friday, June 7, 2019

Breakfast on Your Own

8:00 a.m. – 5:00 p.m. Professional Tour #2: Yellowstone National Park. Discover the magic of America's first national park in a bus tour that will visit all the classic tourist locations while also highlighting the effect of forest fires on the park and restoration efforts. You will see thermal features, wildlife, scenic views, and more in this guided tour of the park. This event includes transportation to and from Big Sky Resort and lunch.



2019 ASMR Professional Award Winners

Dennis Neuman - William T. Plass Award,

Nominated by Kevin Harvey

This award is the highest honor the Society has and recognizes those in research, teaching, outreach, and administration. The award is given to a person who has distinguished themselves in the field of disturbed ecosystem reclamation at the local, regional, national, and international levels.

Dennis Neuman's contributions to the field of land reclamation is highlighted by his 33 years of dedication and service at the Reclamation Research Unit at Montana State University. Dennis directed or participated in all the key research programs that were carried out for government agencies and industrial clients throughout his time at MSU. Dennis ultimately became the director of the Research Unit which earned a world-wide reputation for their contributions to reclamation applied science and developed one of the first graduate degree programs in land rehabilitation. Dennis has educated and mentored generations of reclamation scientists and practitioners, transferring reclamation knowledge and technological advancements throughout the world. He has directed the implementation of reclamation science-based approaches to

remediate some of the most contaminated sites in the world. One such site he was avidly involved in was the Anaconda Smelter and Clarks Fork River CERCLA complex in MT that was the largest superfund site in North America at one point in time. Dennis also has contributed to the transfer of knowledge and technology by organizing and hosting the well-received biannual Billings Land Symposium series from 1996-2009. The Symposium Series only ended after Dennis retired from MSU and pursued a career in the private sector as a land reclamation consultant. While consulting, he has led many successful reclamation and remediation projects and continues to advise many governmental agencies on sound reclamation practices. Dennis is still actively involved in ASMR and has served many dedicated hours on the NEC board and a term of President, leading during some time of crucial change and growth. Dennis is a modest individual who does not strive for recognition as this is his first ASMR award achievement after years of outstanding beneficial involvement in the reclamation field. Congratulations Dennis on a well-deserved recognition.

Cody "Buck" Neely - Early Career Award, Nominated by Robert Nairn

This award is intended to recognize an early career member of ASMR that is involved in reclamation research, teaching, and/or on-the-ground reclamation with a reclamation contractor/consultant, regulatory agency, or mining company. The nominee must have been employed in their field for a minimum of three years but not more than ten years.

Buck Neely completed a BS in Environmental Engineering at Gannon University in 2008 and then got his MS from the University of Oklahoma in Environmental Engineering by May of 2010. He then started his career in mine land and water reclamation projects. Buck has also received his

Professional Engineer license in three states in 2017 making him a PE in Pennsylvania, West Virginia, and Oklahoma. According to his nominator, Buck's work ethic, innovative skill set, and positive attitude are second to no-one. Buck's work does not stop with design, you are also likely to see him working diligently in project management, construction oversite, equipment operating, and data collection with report writing. Through all the projects that Buck has been involved with during his academic studies and reclamation career, he demonstrates the diversity of skills and competence needed for future achievements. One of the most impressive achievements for Buck is that his work has led to fish being observed in a stream that was previously deemed by the US EPA as irreparable. This is an outstanding achievement for anyone with many years of experience, no less an early career individual. He has even gone beyond his work in the US, while collaborating with







the nonprofit organization Engineers in Action, he has designed of a mine water treatment system in the high Andes mountains of southern Bolivia. Congratulations Buck, for this recognition of your early career achievements.



Derek Launius - Reclamationist of the Year Award, Nominated by Jennifer Mumper

The Reclamationist of the year award recognizes individuals demonstrating outstanding accomplishments in the practical application or evaluation of reclamation technology. It also rewards individuals responsible for implementing innovative practices or designs for new reclamation strategies.

Derek Launius received two BS degrees from the University of Southern Illinois Carbondale in Plant and Soil Science; and Mining Engineering. He then received his MBA from McKendree University while starting his career at Peabody. He is a Sr. Engineer at Peabody's

Wildcat Hills-Cottage Grove Mine being responsible for all thing's reclamation. Additionally, he is responsible for the reclamation husbandry and regulatory interactions at multiple other Peabody closed mines in the mid-west region. For the last 12 years Derek has implemented multiple agricultural and soil science best management practices into the reclamation planning at various Peabody mine sites. These protocols have improved the disturbed ecosystem in one of the most productive agricultural regions of Illinois. His implementation of these practices has helped under achieving reclaimed prime farmlands meet or exceed regulatory standards for Proof of Productivity. This has led a variety of national and regional honors and awards for the mines that Derek has had the reclamation responsibilities for. As well as his busy schedule at work, Derek is involved in the agricultural community surrounding the mines and is often sought to lecture at workshops and conferences to share his knowledge. He also operates his family farm and mentors the local youth to become aspiring farmers. Congratulations Derek!!!

Natalie Kruse Daniels - R.I. & L.M. Barnhisel Reclamation Researcher of the Year Award, Nominated by Jen Bowman

The Richard I. and Lela M. Barnhisel Reclamation Researcher of the Year Award recognizes substantive contributions to the advancement of reclamation science and technology through scientific research.

Dr. Kruse is showing outstanding leadership in reclamation research while focusing on water quality topics in the mining, and shale oil and gas extraction industries. Her research entails a variety of hydrologic issues of both surface and groundwater. Her work mostly focuses on the effects of AMD on watershed recovery; and the management, characterization, and treatment of hydraulic fracturing waste fluids. As a member of the Appalachian Watershed Research Group at Ohio University, she manages multiple staff and graduate researchers while securing millions of dollars of research funding. Dr. Kruse's long list of publications and



presentations recognizes her passion to return ecological function to many disturbed hydrologic systems. Dr. Kruse's desire to transfer her knowledge and experience is the foundation for which this award was established to recognize. While most of Dr. Kruse's time is tied up with academic oversite and research, she is still involved in many professional societies and we wish her continued success in her endeavors. Congratulations Dr. Kruse.



The Late Tom Henderson - Pioneer in Reclamation Award,

Nominated by Alan Edwards

This award is presented to an individual that has had significant impact and influence in the field of land reclamation and environmental science relating to mined land reclamation over their entire career.

Tom Henderson led a career in reclamation that has left a memorable impression with all those who have been touched by his passion for ecosystem restoration. Tom's career in reclamation

started in the south east region of the United States with multiple regulatory positions in Kentucky. He then spent some time in the private sector with a consulting company in Denver CO. In 1997 he returned to the regulatory world with the Montana Department of Environmental Quality Remediation division and in 2001 took time to further his education. In 2004 he received his doctoral degree from the University of British Columbia and then returned to the MT DEQ where he continued his reclamation passion until his untimely passing. Tom had two projects while working with the MT Abandoned Mine Lands Program that portrayed his passion for reclamation and touched the lives in a couple of small communities while restoring damaged ecosystems. The McLaren Mill and Tailings project near the north entrance to Yellowstone National Park in Cooke City MT addressed heavy metal tailings contamination into Soda Butte Creek. The cleanup efforts were impacted by steep terrain, challenging weather conditions and short time constraints of cleanup seasons making this successful project more of an outstanding achievement. The cleanup included two years of investigations and design followed by five years of construction to restore the ecosystem so close to YNP. Tom was part of the team that coordinated with the National Park Service throughout the project. The project was completed in 2014. It has received national awards and resulted in Soda Butte Creek being removed from the impaired stream list in 2018 by the MT DEQ. Tom also served as project manager for the construction of a new drinking water system for the community of Sand Coulee in MT. The original water system had been heavily impacted by acid mine drainage, with the new system receiving national award honors. At the time of Tom's passing, he was designing an AMD water treatment plant in Belt MT to restore Belt Creek to be beneficial stream system for all those in the town of Belt. Congratulations to Tom and his family for receiving this award in his honor.

2019 ASMR Memorial Scholarship Award Winners



ASMR Memorial Scholarship: Bachelor of Science: Ashley Rovder

As a graduating senior (as of May 2019) in the environmental engineering department at Saint Francis University, I have had many opportunities to explore various areas of my field. I've worked with local acid mine drainage, wetland plants in treatment systems in South Carolina, algae as a nutritional supplement in Bolivia, and sources of turbidity and best management practices concerning a local reservoir's watershed. Throughout all of this, however, I have worked with ASMR on a research project spanning all four years of my college career, which gave me both experience and a familiarity with the field of mining and reclamation. After graduation, I am working in South Carolina at the Nuclear Power Training Unit-Charleston as an Associate Reactor/Refueling Operations Engineer. I hope to eventually volunteer on sustainability and

reclamation projects in developing areas using all of the abilities I have gained so far, and in time, share this knowledge and my experiences with young professionals who have similar dreams.



ASMR Memorial Scholarship: Master of Science:

Megan Ostrand

Megan is working towards her Master's in Soil Science at North Dakota State University. She studies surface coal mine reclamation, specifically, methods to alleviate compaction and improve soil physical properties. She will graduate in the fall and pursue a career in environmental consulting; she is excited to utilize her GIS skillset. While not working she enjoys functional fitness, frisbee golfing, and being outdoors with her dog, Avery.



ASMR Memorial Scholarship: Doctoral Student:

Michael Nattrass

Michael is a doctoral student studying environmental plant and soil sciences at Mississippi State University. His research focuses on constructed wetlands as a passive water treatment strategy. After graduation in December 2019, he hopes to bridge the gap between industry and academia, from either side, by providing soil and water quality management options for public and private stakeholders.



2019 ASMR Keynote Speakers



Dr. Gwendelyn Geidel is a research professor in the School of the Earth, Ocean, and Environment (SEOE) at the University of South Carolina. After obtaining her PhD in Geology, she began her career in the Department of Geology at USC focused on the prediction and prevention of water quality impacts from coal mining, which lead to not only interesting research questions but legal issues as well. In 1989, she graduated from Law School and practiced environmental law in Columbia, SC. When the USC School of the Environment (SOE) was formed in 1994, she returned to USC as the Associate Dean of the SOE until 2006, when it was merged into the College of Arts and Science. Since then, while

teaching earth resource management and sustainability classes, she continues her research and consulting related to the remediation of ground and surface water contamination caused by mining and other anthropogenic disturbances and the development of sustainable reclamation practices for improved vegetative, soil and water quality. She has published articles and book chapters and is active in community organizations including the Central Midlands Council of Government environmental committee, and Gills Creek Watershed Association. She also serves on several national committees and forums, including the National Council for Science and the Environment's (NCSE) University Leaders and, within ASMR, she is the 2018-19 president.



Dan Powell is the Chief of the Technology Integration and Information Branch in the Headquarters Superfund program at the U.S. Environmental Protection Agency in EPA's Office of Land and Emergency Management. In this capacity, he leads efforts to promote awareness and use of best practices and innovative technologies for site clean-up at hazardous waste sites across EPA's waste programs. He manages a coordinated program of information development and dissemination, training, and direct site support to assist site project managers and waste program staff within EPA, in the States and at the local level understand and apply innovative approaches. Dan has over 30 years of experience in

Superfund and waste site cleanup. Dan has been with the Technology Innovation Program, now part of the Office of Superfund Remediation and Technology Innovation, since 1990 and has served as a Branch Chief for 14 years. Dan has also served in an acting capacity as the Director of the Technology Innovation and Field Services Division (2017). Dan came to the Agency in 1988 as a Presidential Management Intern with Office of Solid Waste and Emergency Response and has worked in the program budget and information management offices; the Office of Underground Storage Tanks; the Region 4 Superfund Program; and the Congressional Office of Rep. Michael Bilirakis (FL). Prior to coming to EPA, Dan worked on the investment portfolio of a large Regional bank, analyzing and trading, among other instruments, municipal bonds, Federal Funds, and government-backed securities. Dan received his Masters of Arts in Public Administration from the Woodrow Wilson School of Government at the University of Virginia in 1988, and he graduated summa cum laude as the class Valedictorian with his Bachelor of Arts degree as a double-major in political science and urban studies from Roanoke College (Salem, VA) in 1985.



Dr. William "Bill" Inskeep is a Professor of Geochemistry and Geomicrobiology at Montana State University, and has worked extensively on microbiomes associated with hightemperature environments in Yellowstone National Park (YNP). Dr. Inskeep has focused on the integration of geochemical and genomic studies of chemotrophic microbial communities across a diverse group of extreme geothermal environments. He also has extensive prior experience in soil and hydrologic processes that govern the fate and distribution of chemical species in the environment. Dr. Inskeep is a founding member of the Thermal Biology Institute (at MSU) and has led several large collaborative and training initiatives supported by the National Science Foundation including a Research Coordination Network and an

Integrative Graduate Research and Training Program for Ph.D. students. He has led several genome sequencing projects of microbial communities in extreme environments supported by the Department of Energy-Joint Genome

Institute, and recently served on a joint appointment with Pacific Northwest National Laboratory focused on microbial interactions in naturally occurring microbial communities.



Autumn Coleman is the Abandoned Mine Lands Program Manager for the Montana Department of Environmental Quality in Helena, Montana. The goal of the Montana AML Program is to protect the citizens from the hazards associated with abandoned mines. With over 3,200 abandoned coal mines and over 3,800 abandoned hard rock mines in Montana in 52 of Montana's 56 counties, the AML Program has a lot of ground to cover. Autumn has Bachelors of Science Soil Science and a Masters in Engineering Project Management from Montana State University. Ms. Coleman has 19 years of professional experience in natural

resources management with over 11 of those years working in mine reclamation. Ms. Coleman's professional career began in 2000 working in Anaconda and Butte, Montana. From 2003 through 2010, Ms. Coleman worked at the Montana Department of Environmental Quality (DEQ) in the Environmental Enforcement Division, the Abandoned Mine Lands Program, and the Public Water Supply Section. From 2010 - 2014 Ms. Coleman was a journeyman level Soil Scientist and Hydrologist for the Helena and Lewis and Clark National Forests. In 2014, Ms. Coleman returned to the Montana DEQ to oversee the Montana AML Program and supervision of the Construction Services Section who oversees major reclamation projects in Montana including the Clark Fork River Cleanup, Streamside Tailings, and others smaller projects. Ms. Coleman is currently the President of the National Association of Abandoned Mine Lands Programs.



Dr. Andrew Ray is an Ecologist with the National Park Service's Greater Yellowstone Network. Andrew has a PhD from Idaho State University, MS from Northern Michigan University, and BS from Purdue University. He works on wetland and water quality monitoring projects in Grand Teton and Yellowstone National Parks and Bighorn Canyon National Recreation Area. His work considers the influence of climate and other environmental stressors on water resources of the Greater Yellowstone Ecosystem.



Dr. Timothy McDermott is a Professor of Environmental Microbiology at Montana State University. He has worked in Yellowstone National Park for nearly a quarter of a century, specializing in acidic hot springs and in Yellowstone Lake. His work has examined thermoacidophilic algae and hydrogen and hydrogen sulfide oxidizing bacteria. In addition, a centerpiece of his research program has focused on microbe-arsenic interactions, where his group has characterized arsenic oxidation, reduction, and methylation. More recently, his lab has turned to focus on aerobic methane synthesis in oxic freshwater environments. Over the

years, he has worked with and consulted for the mining industry and environmental remediation consultants.







